

Competency-Based Education Task/Competency List

Advanced Engineering 8491 – 36 Weeks

Competencies designated by bullets in the left-hand column(s) are considered essential statewide and are required of all students. In some courses, all competencies have been identified as essential. Unbulleted competencies and/or locally added competencies should be included as local conditions permit.

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| 8491 36 Wks | Advanced Engineering TASK/COMPETENCY |
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| | Investigating the Engineering Profession and Related Careers |
| • | 1. Explain the purpose and functions of the technological team. |
| • | 2. Participate in group work and personnel system to manage class and laboratory activities. |
| • | 3. Apply safety rules to laboratory activities. |
| | Relating Objectives of the Course to Students in a Technological World |
| • | 4. List courses that help an engineer work with and for people. |
| • | 5. Describe methods of continuing education for engineers. |
| • | 6. Describe the impact of engineering on society and the environment. |
| • | 7. Identify appropriate community activities for engineers. |
| • | 8. Summarize the characteristics of professional engineers. |
| • | 9. Describe education needed for specialty fields in engineering and technology. |
| • | 10. Identify benefits of study of the humanities and social science. |
| • | 11. Demonstrate a professional attitude toward classroom and laboratory activities. |
| • | 12. Describe the management responsibilities of engineers. |
| • | 13. Program computer-aided machines and numerical control. |
| • | 14. Use appropriate computer application programs to solve problems. |
| • | 15. Write a proposal for an engineering project. |
| | Community Technical Information |
| • | 16. Write a technical report for an engineering activity. |
| • | 17. Present technical information by means other than words. |
| • | 18. Present technical information through computer-aided design and drafting. |
| • | 19. Present technical information in an oral report. |
| • | 20. Write a business letter to request information or material. |
| • | 21. Conduct an interview to gather information. |
| | Preparing a Formal Seminar on an Engineering Case Study |
| • | 22. Identify and describe engineering problems and their solutions. |
| • | 23. Describe the application of mathematics. |
| • | 24. Describe the application of scientific principles in the solution of engineering problems. |
| • | 25. Describe the application of technology in the solution of engineering problems. |
| • | 26. Prepare a model demonstrating an engineering problem and its solution. |
| • | 27. Use engineering graphics to describe the solution of an engineering problem. |
| • | 28. Describe the social, cultural, and environmental impact of an engineering project. |
| | Observing Designs in Nature |
| • | 29. Describe characteristics of natural materials used in selected products. |
| • | 30. Identify plant structures on which engineering designs may be based. |
| • | 31. Illustrate the design of human and animal bones. |
| • | 32. List samples of functional design in birds and reptiles. |
| • | 33. Identify examples of the honeycomb structure in nature and engineering designs. |
| | Reviewing the Engineering Design Phase |
| • | 34. Define and outline steps in the engineering design process. |
| • | 35. Define optimum design and explain why one rarely exists. |

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| 8491 36 Wks | Advanced Engineering TASK/COMPETENCY |
| • | 36. List and define the three phases used in most engineering designs. |
| • | 37. Describe the objectives of the feasibility study. |
| • | 38. Explain the use of the evaluation table during the preliminary design phase. |
| | Using the Design Process as a Group Study |
| • | 39. Use brainstorming as a strategy for problem solving. |
| • | 40. Determine sources of information available for problem solving |
| • | 41. Describe the use of sketches and detail and assembly drawings in the design process. |
| • | 42. Use anthropometric tables. |
| • | 43. Select appropriate materials and processes for design project. |
| • | 44. Determine objectives for an engineering test. |
| • | 45. Formulate an alternate design solution to a problem. |
| | Briefing Others in Results of Engineering |
| • | 46. Pre-register for competitive events. |
| • | 47. Participate in construction of a display of problem-solving activities. |

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